

I CLAIM:

1. A lens array for use in focusing light between a set of photoactive  
5 components and a set of optical fibers, comprising:
  - a plurality asymmetric biconvex lenses formed as a part of a common platform which are:
    - a) collinearly and contiguously positioned in a lateral direction, and
    - 10 b) truncated in said lateral direction so that the lenses have an extended boundary between them and have greater height than width.
2. The lens array of claim 1, wherein:  
said common platform includes a set of alignment pins precisely aligned  
15 with said lenses for mating with alignment holes in a ferrule supporting said set of optical fibers.
3. The lens array of claim 1, wherein:  
said platform and lenses comprise molded plastic.  
20
4. The lens array of claim 1, wherein:  
said lenses have a height which is approximately 1.5 times their width.
5. An assembly for use in optical communications, comprising:  
25
  - a) an optical ferrule for supporting a set of optical fibers disposed in a linear array;
  - b) an optical transmitter subassembly for transmitting photonic signals to said fibers including a set of semiconductor lasers disposed in a linear array;  
and

c) a lens platform including a set of optical lenses having greater height than width and extended common boundaries which are contiguously positioned in a linear array corresponding to said fibers and lasers.

5 6. The lens array of claim 5, wherein:

said lenses have a height which is approximately 1.5 times their width.

7. The lens array of claim 5, wherein:

said platform includes a set of alignment pins precisely aligned with said  
10 lenses for mating with alignment holes in said ferrule.

8. The lens array of claim 7, wherein:

said lens platform and lenses comprise molded plastic.

15 9. An assembly for use in optical communications, comprising:

a) an optical ferrule for supporting a set of optical fibers disposed in a linear array;

b) a optical receiver subassembly for receiving photonic signals from said fibers including a set of semiconductor PIN diodes disposed in a linear array; and

c) a lens platform including a set of optical lenses having greater height than width and extended common boundaries which are contiguously positioned in a linear array corresponding to said fibers and diodes.

25 10. The lens array of claim 9, wherein:

said platform includes a set of alignment pins precisely aligned with said lenses for mating with alignment holes in said ferrule.

11. The lens array of claim 9, wherein:

    said lens platform and lenses comprise molded plastic.

5   12. The lens array of claim 9, wherein:

    said lenses have a height which is approximately 1.5 times their width.

13. An assembly for use in optical communications, comprising:

10   a) an optical ferrule for supporting a set of optical fibers disposed in a linear array;

15   b) a optical transmitter subassembly for transmitting photonic signals to said fibers including a set of VCSELs disposed in a linear array; and

    c) a one-piece lens platform including a plurality asymmetric biconvex lenses which are:

15       1) collinearly and contiguously positioned in a lateral direction parallel with said linear array of lasers, and

    2) truncated in said lateral direction so that the lenses intersect along the centerlines between them and have greater height than width.

20   14. The lens array of claim 13, wherein:

    said lenses have a height which is approximately 1.5 times their width.

15. An assembly for use in optical communications, comprising:

25   a) an optical ferrule for supporting a set of optical fibers disposed in a linear array;

    b) a optical receiver subassembly for receiving photonic signals from said fibers including a set of semiconductor PIN diodes disposed in a linear array; and

TOP SECRET//SI//FOUO

c) a lens platform including a plurality asymmetric biconvex lenses which are:

- 5 1) collinearly and contiguously positioned in a lateral direction parallel with said linear array of diodes, and
- 2) truncated in said lateral direction so that the lenses intersect along the centerlines between them and have greater height than width.

16. The lens array of claim 15, wherein:  
10 said lenses have a height which is approximately 1.5 times their width.

17. A lens and alignment frame for use in optically and mechanically interfacing an integrated circuit chip having a set of photoactive components which is attached to a carrier assembly with a set of optical fibers supported in  
15 a ferrule having a set of alignment holes precisely positioned with respect to said fibers, said frame including:

- 20 a planar base adapted for being mounted on said carrier assembly;
- an array of collinear lenses each of which have greater height than lateral width mounted for focusing light between said array of fibers and said array of photoactive components; and
- 25 a set of guide pins projecting forward of said base for mating with said alignment holes in said ferrule in order to position said ferrule and fibers with respect to said frame, carrier assembly and said integrated circuit chip.

25  
18. The lens and alignment frame of claim 17, further including:  
a tower structure on which said array of lenses and said guide pins are mounted.

19. The lens and alignment frame of claim 18, wherein:  
said tower includes a pair of elevated end sections on which said guide pins are  
mounted.

5

20. The lens and alignment frame of claim 17, wherein:  
said lenses have a height which is approximately 1.5 times their width.

TOP SECRET - E482005